

**REMARKS**

At the time the current Official Action was mailed, claims 1-25 were pending. The Examiner allowed claim 25, rejected claims 1-4, 8-11, 14-21, and 24, and objected to claims 5-7, 12, 13, 22, and 23. Reconsideration of the application in view of the remarks set forth below is respectfully requested.

**Allowable Subject Matter**

In the Office Action, the Examiner noted that claim 25 was allowed. Further, the Examiner indicated that claims 5-7, 12, 13, 22, and 23 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants would like to thank the Examiner for indicating that claim 25 is allowed and for indicating the presence of further allowable subject matter in claims 5-7, 12, 13, 22, and 23. However, for the reasons discussed below, Applicants believe that independent claims 1 and 14 are allowable. Accordingly, Applicants respectfully request that the Examiner reconsider claims 1 and 14 in view of the arguments set forth below. Further, applicants request an indication of allowance of claims 1 and 14 and the claims depending therefrom.

**Rejections Under 35 U.S.C. § 102**

In the Office Action, the Examiner rejected claims 1-4, 8-11, 14, 20, 21, and 24 under 35 U.S.C. § 102(b) as being anticipated by Diab et al. (U.S. Patent No. 6,157,850; hereinafter Diab '850). In rejecting these claims, the Examiner stated:

Diab et al. '850 discloses the same invention including a method and apparatus for measuring a physiological parameter.

Regarding claims 1-4 and 8, Diab et al. '850 discloses obtaining a first and second signal that includes a signal portion corresponding with motion-related events and with arterial pulsation events (column 10, lines 17-38) and combining the two signals to generate a combined signal where the signal portion corresponding with motion-related events is smaller than that present in the first and second signal (column 10, lines 39-53 and figure 4b). Diab et al. '850 discloses using a first wavelength of 910 nm and a second wavelength of 660 nm (column 23, line 23).

Regarding claims 9 and 10, Diab et al. '850 discloses applying a multiplier (column 10, lines 39-53 and figure 4b) wherein the multiplier is a function of the ratio of absorption by hemoglobin (column 54, lines 51-61).

Regarding claim 11, Diab et al. '850 discloses the physiological parameter in a pulse rate (column 36, lines 28-41).

Regarding claim 14, Diab et al. '850 discloses means for obtaining a first and second signal (column 35, lines 8-16) and means for combining the first and second signal (column 36, lines 17-41).

Regarding claims 20 and 21, Diab et al. '850 discloses means for applying a multiplier and a processing device configured to combine the first and second signals (column 10, lines 39-53 and figure 4b).

Regarding claim 24, Diab et al. '850 discloses the physiological parameter is a pulse rate (column 36, lines 38-41).

Office Action, page 2-3.

Applicants respectfully traverse this rejection. Anticipation under 35 U.S.C. § 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under 35 U.S.C. §102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under 35 U.S.C. § 102, a single reference must teach each and every element or step of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984). Thus, if the claims recite even one element not found in the cited reference, the reference does not anticipate the claimed invention.

***Diab '850 does not teach all of the features recited in claims 1 and 14***

Applicants respectfully assert that Diab '850 fails to anticipate independent claims 1 and 14 because it fails to teach all of the features recited therein. The present Application relates generally to using a plethysmograph of a water absorbance signal to correct plethysmographs of hemoglobin absorbance signals for noise artifacts. The water absorbance signal is highly dependent on motion noise, and it gives a good reference signal for removing this noise. As stated in the application, “where water is the predominant absorber, the arterial pulsations diminish and the measured signal becomes largely due to motion related events.” *See* Specification, p. 7, ll. 20-21. Accordingly, independent claims 1 and 14 both recite, “obtaining a first signal . . . at a first wavelength . . . , wherein at said first wavelength water is a dominant absorber of electromagnetic energy in the tissue.” (Emphasis added). As further set forth in

claims 1 and 14, the first signal is used by “combining said first signal and said second signal to generate a combined signal . . . having a signal portion corresponding with motion-related events that is smaller.” This combination may be performed by, for example, subtracting a scaled version of the water absorbance signal from the other signal. *See* Specification, para. [0032].

In contrast to the recitations of claims 1 and 14 discussed above, Diab '850 merely teaches the use of two wavelengths for signal processing, wherein a first wavelength is either 650 nm or 660 nm and a second wavelength is either 910 nm or 940 nm. *See, e.g.*, Diab '850, col. 23, l. 23; col. 42, l. 34; col. 60, l. 37; and col. 62, l. 41. Applicants assert that none of these wavelengths (i.e., 650 nm, 660 nm, 910 nm, or 940 nm) taught by Diab '80 are in a wavelength range wherein water is a dominant absorber of electromagnetic energy in tissue. Indeed, as clearly set forth in the present application, hemoglobin, not water, is the dominant absorber of electromagnetic radiation at all of the wavelengths suggested by Diab '850. *See, e.g.*, Specification, paras. [0031] and [0032], Fig. 3 and Fig. 7. Thus, Diab '850 does not disclose obtaining a signal at which water is a dominant absorber of electromagnetic energy in tissue, as recited in claims 1 and 14 of the present application.

Further, Applicants assert that Diab '850 fails to teach “combining said first signal and said second signal to generate a combined signal . . . having a signal portion corresponding with motion-related events that is smaller,” as recited in claims 1 and 14. In contrast, Diab '850 teaches generating a separate artificial noise signal from the first and second signals by cross-correlating the two signals to remove the primary signals. *See, e.g.*, Diab '850, col. 3, ll. 35-40

and col. 10, ll. 48-53. Once the artificial noise signal is generated, Diab '850 teaches that the artificial noise signal is used in an adaptive noise cancellation algorithm to correct the two signals of interest. *See, e.g.*, Diab '850, col. 3, ll. 54-64. Thus, the original first and second signals in Diab '850 are not combined to form a noise-reduced signal, as recited in claims 1 and 14.

For the reasons discussed above, Applicants respectfully assert that Diab '850 fails to anticipate independent claims 1 and 14, or their respective dependent claims 2-4, 8-11, 20, 21, and 24. Accordingly, Applicants respectfully request that the Examiner withdraw the rejections of claims 1 and 14, and their respective dependent claims, over Diab '850 under 35 U.S.C. § 102. Further, Applicants respectfully request that the Examiner provide an indication of allowance for claims 1 and 14 and claims depending therefrom.

#### **Rejection Under 35 U.S.C. § 103**

In the Office Action, the Examiner rejected dependent claims 15-19 under 35 U.S.C. § 103(a) as being obvious over Diab '850 in view of Jöbsis. As a preliminary matter, Applicants respectfully note that the Examiner has not provided a reference for Jöbsis. Based on the passages cited by the Examiner, Applicants assume that the Examiner is citing the same reference as cited in the Office Action of July 19, 2006, i.e., U.S. Patent No. 4,805,623 (hereinafter Jöbsis). In rejecting these claims, the Examiner stated:

Diab et al. '850 discloses the invention substantially as claimed including an apparatus for measuring a physiological parameter. Diab et al. '850 does not show the means for obtaining a first

signal comprise light emission and light detection optics. However, Jöbsis discloses a spectrophotometric apparatus that uses light emission and light detection optics (column 19, line 57 – column 20, line 11 and figure 7) as a means for directing light to a tissue location and means for receiving light from the tissue location. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the apparatus of Diab et al. '850 with light emission and light detection optics as taught by Jöbsis since Diab et al. '850 requires means for directing light to a tissue and means for receiving light from the tissue and Jöbsis shows light emission and light detection optics are suitable means for directing light to a tissue location and means for receiving light from the tissue location.

Regarding claims 16-19, Jöbsis discloses the light emission optics are configured to deliver electromagnetic energy at the claimed wavelengths (figure 6).

Office Action, pages 3-4.

Applicants respectfully assert that the Examiner failed to make a *prima facie* case that the present application is obvious over Diab '850 in view of Jöbsis. The burden of establishing a *prima facie* case of obviousness falls on the Examiner. To establish a *prima facie* case, among other requirements, the Examiner must show that the combination includes *all* of the claimed elements. *Ex parte Clapp*, 227 U.S.P.Q. 972 (Bd. Pat. App. & Inter. 1985). As discussed above, Diab '850 does not teach “obtaining a first signal . . . at a first wavelength . . . , wherein at said first wavelength water is a dominant absorber of electromagnetic energy in the tissue,” and “combining said first signal and said second signal to generate a combined signal . . . having a signal portion corresponding with motion-related events that is smaller,” as recited in independent claim 14 of the current application. Jöbsis whether considered alone, or in a hypothetical combination with Diab '850, does not obviate these deficiencies. Thus, the Examiner's rejection of claims 15-19, which depend from claim 14 is improper. Accordingly,

Applicants respectfully request that the Examiner withdraw the rejection under 35 U.S.C. § 103 and provide an indication of allowance for claims 15-19.

**Conclusion**

In view of the remarks set forth above, Applicants respectfully request withdrawal of the Examiner's rejections and allowance of claims 1-25. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

**General Authorization for Extensions of Time**

Applicants believe that no further fees are due with this response. However, in accordance with 37 C.F.R. § 1.136, Applicants hereby provide a general authorization to treat this and any future reply that may require an extension of time as incorporating a request thereof. If any fees are due, the Commissioner is authorized to charge Deposit Account No. 06-1315; Order No. TYHC:0147 (009103-009740).

Respectfully submitted,

Date: March 7, 2007



W. Allen Powell  
Reg. No. 56,743  
FLETCHER YODER  
P.O. Box 692289  
Houston, TX 77269-2289  
(281) 970-4545